Format No : CP/TF/01

PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR DENSE BITUMINOUS MACADAM

Lab ID	:	**CP-RW-2017-09-18-01**	**Date: 21-09-2017**
Customer	:	Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.	
Address	:	Yelahanka Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements Roads and Drains at Venkatala 3rd Cross, 5th Cross, 6th Cross and Remaining Cross Roads in Ward No:01 of Yelahanka Sub Division.	
Agency	:	Technical Manager (West), KRIDL, BBMP, Bangalore.	
Customer Reference	:	BBMP/EE(YNK.D)/W.O/11/2017-18	
Source of Sample	:	Sample supplied by Agency	
Sample Condition	:	Satisfactory	
Date of Receipt	:	18-09-2017	
Sample ID No	:	2017-09-18-01-01	
Type of Mix	:	DBM (Dense Bituminous Macadam)	
Date of test	:	18-09-2017	

Table 500-6 : Physical Requirements fo Coarse Aggregate for Dense Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	11.8	Combined Flakiness & Elongation Index for DBM is Maximum 35%	IS:2386 Part I
	Elongation Index	10.7		
Strength	Aggregate Impact Value	23.4	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.69	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.25	Maximum 2%	IS:2386 Part III

Note:
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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2017-09-18-01** **Date: 21-09-2017**
Customer	:	Assistant Executive Engineer, Yelahanka Sub Division, BBMP,
Address	:	Yelahanka Sub Division, BBMP, Bangalore.
Project Name	:	Improvements Roads and Drains at Venkatala 3rd Cross, 5th Cross, 6th Cross and Remaining Cross Roads in Ward No:01 of Yelahanka Sub Division.
Agency	:	Technical Manager (West), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/11/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	18-09-2017
Sample ID No	:	2017-09-18-01-01
Type of Mix	:	DBM(Dense Bitumnous Macadam)
Date of test	:	18-09-2017

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

Note:
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Format No : CP/TF/01

TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2017-09-18-01** **Date: 21-09-2017**
Customer	:	Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Sub Division, BBMP, Bangalore.
Project Name	:	Improvements Roads and Drains at Venkatala 3rd Cross, 5th Cross, 6th Cross and Remaining Cross Roads in Ward No:01 of Yelahanka Sub Division.
Agency	:	Technical Manager (West), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/11/2017-18
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	18-09-2017
Sample ID No	:	2017-09-18-01-01
Type of Mix	:	DBM (Dense Bituminous Mecadam)
Date of test	:	18-09-2017

The results of the tests conducted on the Dense Bituminous Macadam mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.29	11.82	9KN(Min)
2	Marshal flow at 60°C, mm	3.54	3.87	2-4
3	Percent air Voids	4.56	4.17	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.54	14.76	13-15
5	Percent Voids filled with Bitumen(VFB %)	68.98	70.28	65-75
6	Density, g/cc	2.42	2.40	–

Note:-
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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2017-09-21-01** **Date: 23-09-2017**
Customer	:	Asisstant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Sub Division, BBMP, Bangalore.
Project Name	:	Improvements Roads and Drains at Venkatala 3rd Cross, 5th Cross, 6th Cross and Remaining Cross Roads in Ward No:01 of Yelahanka Sub Division.
Agency	:	Technical Manager (West), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/11/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	21-09-2017
Sample ID No	:	2017-09-21-01-01
Type of Mix	:	BC-Plant (Bituminous Concrete)
Date of test	:	21-09-2017
Oven Dry Weight	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	89	89	1.8	98.2	90-100
9.5	702	791	15.8	84.2	70-88
4.75	895	1686	33.7	66.3	53-71
2.36	587	2273	45.5	54.5	42-58
1.18	492	2765	55.3	44.7	34-48
0.6	503	3268	65.4	34.6	26-38
0.3	528	3796	75.9	24.1	18-28
0.15	458	4254	85.1	14.9	12-20
0.075	350	4604	92.1	7.9	4-10
PAN	396	5000	100	0.0	0

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Lab ID	:	**CP-RW-2017-09-21-01** **Date: 23-09-2017**
Customer	:	Asisstant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Sub Division, BBMP, Bangalore.
Project Name	:	Improvements Roads and Drains at Venkatala 3rd Cross, 5th Cross, 6th Cross and Remaining Cross Roads in Ward No:01 of Yelahanka Sub Division.
Agency	:	Technical Manager (West), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/11/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	21-09-2017
Sample ID No	:	2017-09-21-01-01
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	21-09-2017

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	12.4	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.7		
Strength	Aggregate Impact Value	22.7	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.68	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.21	Maximum 2%	IS:2386 Part III

Note:

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2017-09-21-01** **Date: 23-09-2017**
Customer	:	Asisstant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Sub Division, BBMP, Bangalore.
Project Name	:	Improvements Roads and Drains at Venkatala 3rd Cross, 5th Cross, 6th Cross and Remaining Cross Roads in Ward No:01 of Yelahanka Sub Division.
Agency	:	Technical Manager (West), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/11/2017-18
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	21-09-2017
Sample ID No	:	2017-09-21-01-01
Type of Mix	:	BC(Bitumenous Concrete)
Date of test	:	21-09-2017

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

Note:
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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2017-09-21-01** **Date: 24-09-2017**
Customer	:	Asisstant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Sub Division, BBMP, Bangalore.
Project Name	:	Improvements Roads and Drains at Venkatala 3rd Cross, 5th Cross, 6th Cross and Remaining Cross Roads in Ward No:01 of Yelahanka Sub Division.
Agency	:	Technical Manager (West), KRIDL, BBMP, Bangalore.
Customer Reference	:	BBMP/EE(YNK.D)/W.O/11/2017-18
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	21-09-2017
Sample ID No	:	2017-09-21-01-01
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	21-09-2017

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.14	11.03	10KN(min)
2	Marshal flow at 60°C, mm	3.72	3.51	2-4
3	Percent air Voids	4.52	4.33	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.48	14.36	13-15
5	Percent Voids filled with Bitumen(VFB %)	72.87	72.63	65-75
6	Density, g/cc	2.25	2.26	–

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TEST RESULTS OF GRADATION FOR DBM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2017-09-26-01**	**Date: 27-09-2017**
Customer	:	Assistant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.	
Address	:	Yelahanka Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements Roads and Drains at Venkatala 3rd Cross, 5th Cross, 6th Cross and Remaining Cross Roads in Ward No:01 of Yelahanka Sub Division.	
Agency	:	Technical Manager (West), KRIDL, BBMP, Bangalore.	
Customer Reference	:	BBMP/EE(YNK.D)/W.O/11/2017-18	
Source of Sample	:	Sample supplied by Agency	
Date of Receipt	:	26-09-2017	
Sample ID No	:	2017-09-26-01-01	
Type of Mix	:	DBM (Dense Bituminous Macadam)	
Date of test	:	26-09-2017	

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	478	476
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.4	4.8
4	Average percentage	%	4.6	

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Lab ID : CP-RW-2017-09-26-01 **Date: 27-09-2017**

Sample ID No : 2017-09-26-01-01

AFTER EXTRACTION(Trail-1)

Weight of Sample(gm) : 478

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0	100.0	100
26.5	0	0	0.00	100.0	90-100
19	47	47	9.83	90.2	71-95
13.2	59.5	106.5	22.28	77.7	56-80
4.75	166.5	273	57.11	42.9	38-54
2.36	60.5	333.5	69.77	30.2	28-42
0.3	45	378.5	79.18	20.8	7-21
0.075	72.5	451	94.35	5.6	2-8

AFTER EXTRACTION(Trail-2)

Weight of Sample(gm) : 476

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0	100.0	100
26.5	0	0	0.00	100.0	90-100
19	48	48	10.08	89.9	71-95
13.2	65	113	23.74	76.3	56-80
4.75	156	269	56.51	43.5	38-54
2.36	54	323	67.86	32.1	28-42
0.3	62	385	80.88	19.1	7-21
0.075	70	455	95.59	4.4	2-8

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Format No : CP/TF/01

TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID	:	**CP-RW-2017-09-27-01** **Date: 28-09-2017**
Customer	:	Asisstant Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Address	:	Yelahanka Sub Division, BBMP, Bangalore.
Project Name	:	Improvements Roads and Drains at Venkatala 3rd Cross, 5th Cross, 6th Cross and Remaining Cross Roads in Ward No:01 of Yelahanka Sub Division.
Agency	:	Technical Manager (West), KRIDL, BBMP, Bangalore.
Customer Referenc	:	BBMP/EE(YNK.D)/W.O/11/2017-18
Source of Sample	:	Sample supplied by Agency
Date of Receipt	:	27-09-2017
Sample ID No	:	2017-09-27-01-01
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	27-09-2017

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	501
2	Weight of the sample After extraction	B	473	474
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.40	5.39
4	Average percentage	%	5.4	

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Lab ID : CP-RW-2017-09-27-01 **Date: 28-09-2017**

Sample ID : 2017-09-27-01-01

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	0	0	0.0	100.0	90-100
9.5	75	75	15.9	84.1	70-88
4.75	128	203	42.9	57.1	53-71
2.36	51	254	53.7	46.3	42-58
1.18	30	284	60.0	40.0	34-48
0.6	11	295	62.4	37.6	26-38
0.3	50	345	72.9	27.1	18-28
0.15	45	390	82.5	17.5	12-20
0.075	53	443	93.7	6.3	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 474

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	0	0	0.0	100.0	90-100
9.5	85	85	17.9	82.1	70-88
4.75	130	215	45.4	54.6	53-71
2.36	43	258	54.4	45.6	42-58
1.18	31	289	61.0	39.0	34-48
0.6	9	298	62.9	37.1	26-38
0.3	45	343	72.4	27.6	18-28
0.15	60	403	85.0	15.0	12-20
0.075	38	441	93.0	7.0	4-10

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